EXPLORING THE POTENTIAL OF COMPUTER-GENERATED LOG FILES WITH PISA 2012 PROBLEM SOLVING DATA

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With the advent of computers to educational large-scale assessments such as the Programme for International Student Assessment (PISA), log file data became widely available. Log files bear the potential to yield relevant information of students' proficiency levels beyond mere final outcome scores such as correct or incorrect. In this presentation, we will discuss the question whether we can innovatively employ log file data to extract behavioral dispositions allowing for a valid reflection of complex actions and behavioral patterns that are not reflected in final outcome scores.

We will present an example of log file analyses based on the PISA 2012 data from over 40 countries. From log files, the students' strategic behavior was extracted. Specifically, we examined whether students applied the vary-one-thing-at-a-time strategy (VOTAT) of isolated variation as a direct and straightforward behavioral indicator. Not surprisingly, analyses revealed that the use of VOTAT was closely related to overall performance in the specific problem solving task we employed. Additionally, we were able to conduct another set of meaningful analyses of the log file date: we identified different groups of students and their use of VOTAT with substantially different intervention needs ranging from students that did apply VOTAT ('full isolated variation') but could not adequately use the information they had generated to students that did not demonstrate any understanding of the principle of isolated variation ('no isolated variation') and, thus, failed in solving the problem. There was also a small group of students that used an (unnecessarily) complex strategy, but still succeeded in solving the task.

In this, tentative investigations did not only allow us to relate strategic behavior to overall performance – a well-acknowledged finding, but to further delineate different levels of strategic proficiency on a very fine-grained level. On this background, we will discuss the challenges and the potential coming along with the broad availability of log files that might, ultimately, lead either to a revolution in the understanding of processes and behavioral patterns or to the insight that log files are no valid reflection of real-world behavior and, thus, bear little potential for the field of education.

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